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UTILITY APPLICATION FOR UNITED STATES PATENT  
FOR  
A HANDLE

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**TITLE OF THE INVENTION**

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**"A Handle"****BACKGROUND OF THE INVENTION**

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This invention relates to a handle.

The present invention more particularly relates to a  
15 pivoting handle of a type where the handle can fold  
between operative and stored (non-use) positions. A  
handle of this type would commonly be used as part of the  
winding mechanism of a closure operator.

20 It is, for example, known to provide a closure operator  
for the opening and closing of a closure such as a window  
sash hingedly mounted in a window frame. The operator  
includes a handle which can be rotated so as to operate a  
winding mechanism whereby an elongate chain or the like  
25 can apply the opening or closing action to the hinged  
sash. An example of such a window operator can be found  
in our US patent specification No's 5829199 and 5937582.

It is also known to construct an operator handle of this  
30 type so that it is able to be folded between use and non-  
use positions. For example, an operator handle of this

type can be found in our New Zealand patent specification  
No. 335475.

It is known with such foldable handles to provide a detent  
5 which endeavours to hold the handle at least in its in-use  
position. This is to try and prevent the handle  
"collapsing" during operation. However, a detent  
mechanism is not always able to withstand the forces which  
may arise during operation. Thus even the presence of a  
10 detent does not prevent the handle from collapsing during  
operation.

Nowadays the aesthetic appeal of hardware is important.  
Therefore, in addition to the hardware having utility it  
15 must also not adversely impact on the look of say the  
window with which the item of hardware is associated.  
Consequently, any means for locking a handle in, at least,  
its in-use position must be unobtrusive with any locking  
mechanism largely confined within the interior of the  
20 handle. There must, however, also be a balance between  
the mechanism having aesthetic appeal yet at the same time  
being ergonomic.

**SUMMARY OF THE INVENTION**

It is an object of the present invention to provide a  
5 handle with a locking mechanism whereby the handle can, at  
least, be locked in its operative position but yet be  
releasable to fold to a non-use position.

It is a further object of the present invention to provide  
10 a lockable pivoting handle where the locking mechanism  
which can enable the handle to be at least locked in its  
operative position does not adversely impact on the  
aesthetics of the handle with the majority of the locking  
mechanism being confined within the handle.

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Broadly according to the present invention there is  
provided a handle which includes a handle member pivotally  
coupled to a base and a locking mechanism which releasably  
locks the handle member in a position relative to the base  
20 which corresponds to an in-use position of the handle  
member, the locking mechanism including a locking member  
within the handle member, said locking member being  
movable between a first position where it performs a  
blocking action between the handle member and the base to  
25 prevent pivotal movement of the handle member relative to

the base and a second position where said blocking action is removed, the locking member being coupled to a push button accessible at an exterior surface of the handle member.

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Preferably the push button includes a head which is slidably located in a recess in the handle member. In the preferred form the peripheral shape of the recess substantially corresponds to the peripheral shape of the

10 button.

In the preferred construction the locking member is biased into said first position by a biasing means. The biasing means is preferably a leaf spring. The leaf spring can be  
15 fixed to the locking member and have a distal end which acts on a portion of the handle member.

According to the preferred form there is also provided stop means to prevent movement of the locking member under  
20 action of the biasing means from moving beyond the first position.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

In the following more detailed description of a preferred embodiment of the present invention reference will be made to the accompanying drawings in which:-

5        Figure 1 is an exploded illustration of the component parts of a handle incorporating the present invention,

10       Figure 2 is a cross-sectional illustration of the handle of Figure 1, the handle being shown in the operating position,

15       Figure 3 is a view similar to Figure 2 but with a release button depressed to enable the handle to be folded into a stored position,

20       Figures 4 and 5 are views similar to Figure 3 but showing the handle being progressively moved toward the stored position, and

Figure 6 is yet a further similar view but showing the handle in the stored position.

**DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE**

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**INVENTION**

As shown in the drawings, the handle includes an elongate handle member 10 which is pivotally coupled to a pivot base 11. The distal end of the handle 10 is provided with a knob 12. The pivot base 11 includes a connecting portion 13 whereby the pivot base 11 can be connected to a mechanism to be rotated such as the winding mechanism of say a window operator.

10 The manner in which the pivot base 11 is coupled by mounting portion 13 to a winding mechanism and the actual construction and connection of the knob 12 to the handle 10 does not form part of the present invention.

15 As illustrated by Figure 1 the handle 10 incorporates a shaped cavity 14 which incorporates a pair of opposed surfaces 33. Projecting from the surfaces 33 is a pair of opposed spigots 34.

20 The pivot base 11 has, at opposite sides thereof, a recess 35. An opening 36 leads into each recess, the opening 36 being of a width which is less than the diameter of the recess 35. As can be seen in Figure 1 each spigot 34 has a flattened side 37 so that when the handle member 10 is  
25 positioned relative to the pivot base 11 which corresponds

to the "stored position" the spigots 34 can be pushed through the openings 36 such that the spigots become located in the recesses 35. The spigots 34 can thus rotate in the recesses 35 thereby establishing the pivot axis about which the handle member 10 can be folded between the in-use (operating) and non-use (stored) positions.

As can be seen from Figures 2 to 6 the handle 10 can be pivoted relative to the pivot base 11 so as to be folded from the operating position to the stored position. Figure 6 shows the handle 10 folded into the stored position.

According to the present invention the handle is positively locked in the operating position by a locking mechanism. This, however, is according to a preferred form of the invention but, in another form, the handle 10 can be positively locked in both the operating and stored positions. In yet a further form the handle could be held by a detent action in the stored position. The following description will, however, describe a handle 10 that can be positively locked in the operating position and simply rest in the stored position.

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Associated with the shaped cavity 14 is a moveable button 15. The button 15 has a head portion 16 which is slidably engageable within a shaped recess 17 in the outer surface of the handle member 10. In the preferred form the peripheral shape of the shaped recess 17 is commensurate with the peripheral shape of head 16. Recess 17 opens into recess 14.

Extending from the head 16 is a locking member which is formed by a stem 18 which has at its distal end an enlarged section 19. This enlarged section 19 includes a lip 20 which in the operating position of the handle engages against a projection 21 which is formed as part of the handle 10. The wall 21 in part defines a recess 17a which opens into recess 17.

The head 16, stem 18 and elongated section 19 are preferably moulded in one unit from a plastics material. In a preferred form the plastics material is fibre reinforced.

The engagement of lip 20 with projection 21 arises because the button 15 is biased to such position by a spring element 22. In one form of the invention the spring element 22 is formed by a separate leaf spring element,

one end of which is anchored between walls 33 of cavity 14. A cranked free end of the spring can thus engage against a shaped or profiled area of the stem portion 18 to apply a biasing affect on the button 15/stem 18.

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The spring element could be a coil spring which engages between head 16 and the end wall surface 21a (of wall 21) of recess 17a.

10 However, in the preferred form of the invention the spring 22 is a leaf spring mounted to or formed as an integral part of button 15. As can be seen clearly in Figure 1 the leaf spring 22 extends along the stem 18 from button 15 to terminate a distance from the lip 20. Thus as shown in  
15 Figure 2 the distal end of spring element 22 engages against wall surface 21a.

Accordingly, the spring element 22 sets up a biasing effect when the button 16 is pushed inwardly from the  
20 position shown in Figure 2 to the position shown in Figure 3. The biasing action of the spring element 22 is such that the stem portion 18 is biased to move in a direction which causes the head 16 of button 15 to project from or be located primarily within the shaped recess 17 as can be  
25 seen, for example, in Figure 2. The extent by which the

head 16 projects from the recess 17 is determined by the stop action of the lip 20 engaging with wall 21.

Referring now to Figure 1, it will be seen that the enlarged portion 19 incorporates a contact surface 27 which engages with a top surface 28 (Fig. 2) of the pivot base 11. Because of this interface of surfaces 27 and 28 and the contact between enlarged portion 19 and the end wall 21 a mechanical blocking action against any pivoting of the handle 10 relative to the pivot base 11 is established.

If it is desired to move the handle member 10 from the operating (first position) to the stored (second position) positions a pressure e.g. via the thumb or the finger of a user of the handle is applied to head 16 of button 15. This causes the head 16 to move into the shaped recess 17 against the pressure of spring 22. This results in a corresponding movement of the stem portion 18 until the head 16 is prevented from further movement by virtue of contact between the underside of head 16 and wall 17b of the recess 17 (see Fig. 3).

At this point a clearance 29 is established between the edge 31 (see Fig. 1) of top surface 28 and the adjacent

inclined surface 30 of enlarged portion 19. This clearance 29 enables the handle 10 to be pivoted relative to pivot base 11 so that it ultimately assumes the stored position shown in Figure 6. As shown in Figures 4 to 6  
5 release of pressure on the button 15 enables the button, under the action of the bias created by spring element 22 to move back toward its "rest" position until in the stored position of handle 10 the lip 20, once again, engages with wall 21 (Figure 6).

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To return the handle 10 to the operating position, the handle is simply lifted up (un-folded) into the operating position. During movement back to the operating position the inclined surface 30 of the enlarged portion 19 engages  
15 with the inclined surface 32 of the pivot base 11. This causes the button 15 to once again move against the biasing force of spring 22 but only until such time as the inclined surface 30 passes over edge 31 and surface 27 of the locking member locates above surface 28 of the pivot  
20 base 11 whereupon the button 15 is free to move under the action of the spring 22. This causes the button 15 to revert to its projecting "rest" position whereupon the handle member 10 is automatically locked into its operating position.

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Because of the action of spring element 22 the button  
reverts reasonably quickly to its rest position. In doing  
so the lip 20 moves into contact with projection 21 in  
such a way that an audible "click" is created. This  
5 provides an aural indicator to the user that the handle  
has reached its operating and locked position.

A further feature of the invention is the method of  
assembly of the component parts. As described above the  
10 pivot base 11 is combined by aligning the smallest cross-  
sectional profile of the spigots 34 with the restricted  
openings 36 into recesses 35. Once this has occurred the  
enlarged end 19 of the stem 18 is introduced into the  
recess 17 and forced through the aperture which is defined  
15 by sidewalls 14a of the recess 14, the top surface 28 of  
pivot base 11 and the lowermost edge surface of projection  
21. This end of the leading edge 38 of lip 20 is slightly  
curved or chamfered to enable the enlarged end 19 to be  
forced through the aforementioned aperture. Once the lip  
20 20 has past through the aperture the locking member 18 is  
prevented from being readily withdrawn. Furthermore, the  
presence of enlarged portion 19 adjacent surface 28 of  
pivot base 11 prevents the pivot base from being slid off  
the spigots 34.

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The handle can thus be readily assembled by sliding the handle onto the pivot base 11 followed by insertion of the locking member 18. The three components interact in such a manner that neither the locking member 18 nor the pivot  
5 base 11 can be readily disassembled from the handle member 10. No separate fasteners are therefore required in the assembly of the component parts.

Throughout the movement of base 11 relative to the handle  
10 surface 32 of the base 11 is in contact with edge 27a of the enlarged portion 19. This can be achieved by profiling surface 32 in such a way as to ensure that the contact is continual.

15 This contact provides a number of benefits. It stops the button 15 from rattling. It also holds the button 15 against becoming displaced i.e. lip 20 will always act as an end stop. The contact also tends to bias the handle 10 towards its stored position once the blocking action has  
20 been removed.

The present invention thus provides a foldable handle which is positively locked in its operating position. When the handle is being used to rotate say a winding  
25 mechanism it will not collapse under such use.

Nevertheless, by a simple pushing action on the button 15 the handle 10 can be released so that it can be moved into a stored position. The handle when moved back into the operating position is automatically and audibly locked  
5 into such position.

The invention thus provides a very simple yet effective means of locking a foldable handle in its operating position. The mechanism is also easy to use so that the  
10 handle can readily be moved into a stored position. By virtue of the head of the button closely engaging within a shaped recess in the handle, the presence of the button does not have any adverse effect on the aesthetic appearance of the handle. The aesthetic appeal of the  
15 handle is not adversely affected by the presence of the locking mechanism as this is confined within the handle and thus largely out of view.